Woman C.P.A.

Volume 31 | Issue 6 Article 3

11-1969

Your Oil and Gas Well - How It Came to Be

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YOUR OIL OR GAS WELL— HOW IT CAME TO BE

The author dicusses the fascinating world of oil and gas production, its terminology, its beginnings and how the income reaches the ultimate investor.

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Do you own an interest in an oil or gas well? Or, do you wish you did? Or, have you given thought as to how oil and or gas income reaches the investor? Or, as an accountant, have you a reasonable comprehension of the processes and terms relevent to this fascinating industry? Let us consider a few of these processes and terms.

It Begins

It all begins with a great deal of study of the various formations and stratas of the earth's structure of a given area by geologists and other technical men. Months of research of records on similar areas are involved. Conferences are held, and finally reports are made to management that certain conditions exist in a particular area which have proved to be fruitful and productive in other areas.

If this particular area is a new, unexplored one, extreme precautions are taken to insure that the company desiring to test the area is kept a secret. Generally independent operators as well as the major companies use a lease broker to go into the area to secure long-term leases from the various land owners. 'Lease hound' is the unofficial title given the lease broker who obtains leases. All leases are made to the lease broker who in turn makes assignments to the company or individual for whom the leases have been secured.

When a lease is negotiated by a broker, he offers a given amount per acre as a 'bonus' and/or 'lease rental' which is the consideration for the grant or assignment of an oil or gas lease. The rates vary per acre depending upon the area and the proximity to the proposed well area. At the expiration of the lease, if the lessor is still interested in the area but is not ready to commence a well, a 'delay rental' is paid the lessee for the privilege of such postponement of operations. There are also times when the lessor wishes to continue the lease for an additional period of time (generally longer than one year) and for which delay rental would not be in the best interest of the lessor. In this event the lessor will execute what is called a 'top lease.' This new lease is secured prior to the termination of the original lease and becomes effective upon expiration of the old lease. Consideration for this 'top lease' is generally along the same line as the original lease.

The Development

Now that the leases have been secured and the necessary geological data has been reviewed, management begins the study to select the appropriate spot where drilling will be done. Sometimes one company is not able to secure leases on all acreage adjacent to the proposed well site. This requires cooperation with other individuals and/or companies who have leases on the adjoining land. Funds must be secured to drill the well and, in the event more than one company could have a potential interest in the area to be explored, the operating company gets money from the other interested parties. These funds are called 'contributions' and are either 'dry-hole' or 'bottom-hole.' The 'dry-hole' contribution is the money paid to the operating company for use in the drilling of a well on property in which the payor has no interest. This money is payable *only* if the well is found to be non-productive. The 'bottom-hole' contribution is the same type of payment but is payable whether the well is productive or non-productive.

Sometimes the company holding the lease on the property does not wish to spend money for the development of the property so they will make a deal with another company or an in-

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dividual to do the developing. This type of an arrangement is known as a 'farm-out' and more technically defined as a 'transfer of an oil or gas lease in order to secure development.' The assignor usually retains an overriding royalty but may retain any type of interest or adjoining acreage.

Let us assume that a 'farm-out agreement' has been executed, the location selected and letters of agreement to pay or payments of required contributions toward the financing of the development have been secured by the 'operator' of this work. The 'operator' is 'one who holds all or a fraction of the working interest or operating rights in an oil or gas lease.'

We are now ready to secure bids to do the actual drilling. Bid proposal forms are sent to several drilling contractors with a request that each submit a bid for drilling to a given depth or per other specified instructions. The usual type of drilling contract calls for a price per foot to a given depth and is more formally called a 'footage contract.'

If there is a possibility that the operator might wish to drill to a depth deeper than the proposed depth shown on the contract, the drilling contractor is requested to submit additional prices per day for any other work to be done. The common term for this is 'day work rates' which technically defined is 'a fixed price per day for a drilling rig and crew to drill per instructions of company or operator to a greater depth than that specified in the footage contract.'

There is still another type of contract for drilling which is called a 'turn-key contract.' This is a contract for the drilling of a well which requires the drilling company to drill a well and, if commercial production is obtained, to equip the well to such a stage that the lessee or operator may turn a valve and the oil will flow into a tank.

The bid forms received by the date specified on the request are carefully reviewed by the company requesting them. Based upon the drilling contractor's reliability the contract bid is selected which will provide the least expense per foot and day work rates to obtain the desired depth. The contract is signed by the company and an executed copy is completed by the contractor and returned to the company. This contract will specify a date on which operations must be started by the contractor.

The Drilling

The drilling contractor first must move his equipment onto the location. The derrick of the drilling rigs now are generally moved in units. However, in the early days of drilling it was necessary to take them apart and rebuild them on a new site. Originally, drilling equipment was called 'cable tools' and such drilling was accomplished with a solid steel cylindrical bit working vertically in the hole and activated by a walking beam and steel line. Equipment now is mostly powered by gasoline motors succeeding the earlier steam type of equipment used following the cable tool type of drilling. All of the moving into a location is accomplished by the use of heavy tandem trucks and trailers, and generally, a contractor makes arrangements for enough trucks to load and move the entire rig and miscellaneous equipment in one move by a moving contractor. Some of the major drilling companies have their own trucks for this purpose rather than engaging the services of an outside trucking contractor.

The derrick is set up over the site which has been staked by the operator. The other equipment is placed in the necessary positions for the proper operation of the rig. We are now ready to 'spud in' the well which is the actual start of drilling operations. Drilling reports are sent in by the man in charge of the drilling rig (he is known as the 'toolpusher') describing the progress being made or the type of operation performed during the day.

The forms which come into the office of the drilling contractor will be records reporting work of three shifts of five-man crews including a driller, derrickman, motorman, and two helpers. The crew (these five men) are responsible for all the labor required during the eight hour period under general drilling conditions. It is the driller's duty to keep a constant watch on the actual drilling, making sure sufficient pressure is applied on the drilling equipment to reach the required depth. Each driller checks in his beginning depth and the depth he has reached when the relief crew takes over the work. To the writer, the drilling operations are most fascinating and colorful and unless the crew has been tipped off that they should mind their manners and language the color of the air is often blue as they perform their duties at the rig.

The term 'bronc' used around the well, indicates that one of the helpers had been promoted to a 'driller.' A 'roughneck' is defined as a general all-around worker on a rig, while a 'roustabout' is a semi-skilled laborer who assists the foreman. Reference made to a 'deadman' is not a sadistic discussion of some man who had died. Rather, the drilling crew is referring to a block of timber or heavy material buried in the earth as an anchor to which guy wires are tied to steady the oil derrick and other towering equipment. A 'dog-house' is not a place where a dog sleeps. It is a 'small house located on the rig floor or nearby and is

used as office for the driller and as a storage place for small items.' The 'knowledge box' is the place where the driller keeps various records on the drilling operations. 'Headache' denotes the existence of danger from falling objects around the rig.

Two very odd terms on the first drilling reports will be drilling 'rat-hole' and 'mouse-hole.' Each of these have a particular place in the drilling operations. On the derrick floor is a round turn-table in which a square piece of pipe fits. This square pipe is known as the kelly joint and it is attached at the top of the drilling pipe during actual drilling operations so that the turn-table will rotate the pipe. When it is necessary to detach the kelly joint from the drilling pipe, the kelly is placed in the 'rat-hole' until it is ready to be used again. When the crew is getting another joint of pipe ready to attach to the drill stem or in the event they are putting pipe in the well for production, then the joint on which connections are being attached is placed in the 'mouse-hole' until the crew is ready for it.

Where time is reported for 'making a trip' this is not a drug oriented happening. The crew is pulling the drilling pipe out of the hole to change a bit, add another joint of drill stem, or perhaps run some test or some other operation the operator feels is necessary at this point of drilling. While the drill pipe is out of the hole and is neatly suspended in the derrick, an electrical log may be run on the formations found since the beginning of the drilling. These electrical logs look a great deal like an electrocardiogram and from the information developed the operator may decide to take some samples from the walls of the well to see if the required depth or productive formation has been reached. 'Coring' or going in with 'core barrel' indicates that samples are being cut from the formations. The term 'fishing' indicates that the crew is trying to retrieve something (some pipe, a drill bit, or similar thing) which has become detached and is in the hole.

The bills to the company for the actual drilling may state that due to circumstances beyond the control of the drilling crew, circulation has been lost. 'Lost Circulation' is defined as a rotary drilling hazard when 'mud' is lost in very porous or cavernous formations and fails to be circulated back into the mud pits. 'Drilling mud' is defined as an artificial mud containing a heavy constituent, such as a barite, that is pumped into oil wells to hold back the natural gas during drilling. Pressures inside the hole prevent drilling operations to continue until the pressures are under control. This lost circulation, if not brought under control, can cause 'blow-outs' and oftentimes fires. In the event of a blow-out from the gaseous formation, the pipe, etc. is blown out of the hole in a twisted mass and the derrick is generally demolished or badly damaged.

Let us assume that the contract called for a depth of 7,000 feet and the electric logs of the formation and the samples taken by the coring indicate productive sand has been reached at 6,990 feet. Production can also be had at approximately 7,025 feet. However, the well was actually drilled to 7,050 feet to give sufficient depth for all pipe, casing, fittings, etc. on the bottom or near the bottom of the hole. We have drilled this well to a greater depth than was called for in the contract because surveys of the area or a comparable area showed that production could be found somewhere between 6900 and 7200 feet. The company decided on the 7,000 foot depth for the footage rate realizing that if it was necessary to go below this depth there should not be an excessive amount of money or cost involved for the additional footage on day work rates. Day work rates also apply when the company requests the operator and crew to stand-by while management makes their decisions as to how much farther they want to drill or if the well is to be completed in the sand which has been reached.

Oil Production

Now that the well is drilled to 7,050 feet finding productive sands at 6990 and 7020 feet, both of which the operator wants to take oil from, the next step is to complete the well for production. This will be a dual completed well (a well which produces from more than one sand at the same time) and it will be necessary to put both casing and tubing in the well. The casing is generally 5½″ in diameter while the tubing is generally 2⅜″. This permits the placing of the tubing inside the casing with the tubing placed in the lower sand while the casing produces from the upper sand. This allows the oil from the lower sand to reach the top of the well through the tubing while oil from the upper sand comes up through the casing and around the tubing. When casing and tubing have been secured in place inside the hole, valves and fittings are attached. To the people in the oil industry that valve or fitting assembly at the top of a well to control the flow of oil is the 'Christmas Tree.'

In the case of oil wells, it is necessary to hold the oil in storage tanks until it can be moved to refineries. Since the cost of pipelines into main lines to the refinery is quite expensive, oil is generally moved from the tanks by means of tanker trucks. This is almost always true of wells on newly developed acreage.

Production Control and Reports

When several wells have been drilled in a given area a name is selected by the operator and then reference is made to a well within a specific 'field.'

The writer is not familiar with states other than Texas as relates to the oil industry. Texas has a governing board known as the Texas Railroad Commission which controls the amount of oil or gas which can be produced in any one month for a given well. In cases of several wells in an area, termed a field, the 'allowable' for the month governs all wells within the field.

Rank wildcat wells or wells so widely separated that a 'field' does not exist are not covered by the field producing rules. However, they too, are often regulated on the production per month. Monthly production reports must be submitted for each well. In cases of fields, a report covering each well within the field is made on one report.

A tax known as 'severance tax' is imposed upon each producer by the state and monthly reports are made to the State Comptroller's office together with payment of the tax. This tax is passed on to the various interest owners when payment is made for the monthly production.

For the person receiving the income, the decimal fraction ownership is applied to the tax deducted and the tax so calculated is added back to the net check for the purpose of determining how much 'depletion' will be allowed for Federal Income Tax purposes to the interest owner for the year.

Depletion

'Depletion' is based on the gross income from the oil and/or gas and can be either calculated by the percentage of gross income method or the cost method. In the case of operators or others with a working interest in the well, the percentage method could be limited to 50% of the taxable income from the lease or leases and this could be considerably lower than the percentage allowable had there not been operating costs. Cost depletion is based on the estimated reserves to be recovered from the well. The estimated number of reserve units (barrels of oil or million cubic feet of gas) is divided into the basis of the property or cost. The quotient is the cost depletion per unit and this amount multiplied by the number of units extracted during the year determines the cost depletion deductible for the year.

The Pay-off

Funds from the production of oil, gas and other by-products must be paid to the respective owners of the well. Before funds are disbursed, all expenses pertinent to such production are deducted. On royalty ownership as well as working interest ownership, the expenses are generally the production taxes and cost of transporting the oil or gas to point of sale. Persons who own working interests in leases are billed monthly for their portions of the general operating expenses by the operator of the leases. A 'Joint Operating Statement' is prepared listing all expenses incurred for the month other than the taxes and transportation. This statement may also include additional items which become part of the capital expenditures on the well or wells, as well as the general operating overhead for the month. The joint operating statement totals are divided according to the interest owned by each party for monthly billings.

When a well becomes productive, the operator of the lease will review all records pertaining to the original lease and any assignments which may have been made by the operator and/or other interested parties to third parties to determine how many people are entitled to a percentage of the profits. A form commonly known as a 'Division Order' issued by the company purchasing the fuel is filled in showing all of the names and fractional participations of the working interest and royalty ownerships under the producing property.

The owner of land has what is known as 'mineral rights' in the property. 'Mineral rights' are a perpetual ownership of oil, gas, and other minerals beneath the surface and can only be conveyed by deed. If an owner when conveying land to another party reserved all of the mineral rights the person who acquired the land would have only the surface rights and would be excluded from participation in the oil income except for lease rentals. Holders of mineral rights will receive lease rentals only if they own the surface rights also. Payments to the owners of the mineral rights come out before anyone else gets anything.

In the event the person owning the mineral rights dies the heirs come in for this interest. Each time a change of this kind occurs it is important for a new division order to be executed so that funds may be properly distributed.

In order to know how much funds are to be distributed to the various interest owners on a particular lease or leases, the production department of the company purchasing the oil or gas must furnish its accounting department what are commonly known as 'run tickets.' These represent the amount of oil and/or gas which may have been purchased from a specific

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Of passing interest was a footnote in the decision to the effect that the surviving corporation should have been able to use the carryover to the extent of profits generated by its own operations. The issue had not been raised in the case, however, and the entire loss was disallowed. If the acquired corporation had been maintained intact a portion of that loss could have been absorbed. Where the profits of the loss company therefore, are susceptible of proof, this point should be borne in mind, as the Commissioner is empowered to allow as much of the loss carryover as does not result in tax avoidance.

TAX REFORM

It would be impossible in this column to analyze the impact of the present Tax Reform bill on future transactions. A word to the wise tax practitioner, however, should be sufficient. A careful study of all its provisions should be made, accompanied by a post review of prior tax planning to determine what initial objectives are affected by the Bill. Of immediate import is the effective dates of many provisions, regardless of the date of enactment—the July 25, 1969 date applicable to the alternative capital gains tax for individuals, for example, is of paramount consideration in the current year.

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lease. Major oil and/or gas companies have a production accounting department where all run records are computed, proceeds from sales are determined and distributions to the various interest holders are made.

Several other types of payments may be made for specific purposes and for a limited time. Some of these include a 'carried interest' or sometimes called a 'revisionary interest' which is defined as a 'working interest participation in producing property whereby the operator is reimbursed his investment out of oil before the recipient receives a percentage share of net income.' There is also an 'oil payment' which is a fixed sum derived from a percentage of the gross income from production. This oil payment could be for a sale of a portion of the production in a working interest ownership, it could represent a gift to another or perhaps to a foundation or non-profit organization, or other types of assignments of interest with oil payments reserved. 'Over-riding royalty' represents a percentage of the gross income from production deducted from the working interest and is free and clear of expenses except for production taxes and transportation charges.

'Working Interest'

Reference has been made in several places throughout this article to the 'working interest.' For clarification, this is defined as 'the operators mineral ownership involving the cost of drilling, completion, equipment and producing in contrast to the (free) royalty interest. These costs may be either tangible or intangible. The tangible represents that part of cost included in equipment and lease cost and is capitalized and depreciated over a period of years. The intangible costs represent labor, supplies and such other expenditures which are considered not to have a salvage value.

The Records

The offices of the oil operators contain such records as lease records, lease and well equipment ledgers, crude purchase journals, tank farm daily reports, crude sales journals, summaries of oil receipts and deliveries as well as the standard inventory, cash receipts and disbursements journals and general ledgers found in most business offices. Each of these either individually or collectively are a very important segment of the accounting system for this interesting industry.

In Conclusion

Another segment of the oil industry which has come into its own within the last ten years could be a complete paper within itself since it varies in so many ways from the work done on land. In 'offshore drilling' some of the equipment is quite similar, transportation to and from the site is definitely not the same, and the crews are provided living quarters for several weeks at a time before returning to shore for leave. Helicopters are proving they have a permanent place in the movement of materials and/or crews between the shore and the installation at sea.

As with the space program which has become so magnificent over the last few years, only time will tell what is yet to be explored and depths which can be reached by man during the exploration of new areas in deep water drilling. Surely it will be an interesting time ahead with new terminology, new accounting systems and new methods of operations.

If all accounting data is stored in the computer, how can the client blame the auditors for everything that cannot be located after the audit?